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(54) **Coin pay-out apparatus.**

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Description

This invention relates, in general, to a coin pay-out apparatus. From one aspect, it relates to a control apparatus of a coin pay-out apparatus in which the coin pay-out apparatus is prevented from erroneously paying out coins. From another aspect, it relates to a coin pay-out apparatus having such a function as to automatically remove a coin clogging.

An automatic vending machine, a money exchanger, or a game machine such as a slot machine, in which a hard money type token is used, is built in with a coin pay-out apparatus for paying a hard money or a token (hereinafter referred to largely as a "coin") out into a discharge port. Such a coin pay-out apparatus just referred to is connected to a bucket containing a number of coins. A bottom portion of the bucket is formed with an opening through which the coin to be paid out is fed into the coin pay-out apparatus.

The coin pay-out apparatus includes a rotary disc plate driven by motor. The rotary disc plate is actuated in response to a coin pay-out signal. When the rotary disc plate is actuated, coins are discharged one by one through the discharge port provided adjacent to the circumference of the rotary disc plate. Disposed in the vicinity of the discharge port is a coin sensor for detecting the discharged coins one by one. A detection signal emitted from the coin sensor is counted by a counter. At the time point when the counted figure reaches a predetermined number of coins paid out, a pay-out finishing signal is issued. Due to the foregoing, the rotary disc is stopped its operation.

By the way, since the bucket contains a large number of coins to be used for a pay-out, the coins are sometimes overlapped with respect to one another to form the so-called bridge at an upper portion of the opening of the bucket, which invites a coin clogging. If such coin clogging is taken place, no coins are brought to the rotary disc plate from the opening of the bucket. Accordingly, it creates such a serious situation as that even if the rotary disc plate is rotated, no coins are paid out.

In this way, action of the coin pay-out apparatus is effected by controlling the motor for rotating the rotary disc plate with an electric signal. However, if the motor is actuated by only the coin pay-out signal, sometimes there occurs such an undesirable situation as that coins are suddenly paid out when an imitation coin pay-out signal is generated due to, for example, noise caused by static electricity and/or noise produced from environment. Further, in the case that such coin pay-out apparatus is built in a game machine for use, there again occurs such an undesirable incidence as that the coin pay-out apparatus is actuated when a program for running the game is happened to run away by some reasons.

Furthermore, in the conventional coin pay-out apparatus, when the afore-mentioned coin clogging is taken place, the clogging must be removed by man power. Accordingly, when a coin clogging is taken place in a coin pay-out apparatus employed in a game machine such as, for example, a slot machine, the game is interrupted to remove the coin clogging. It bothers not only the administrator of the game but also the game player much.

GB-A-2105508 (Chance Manufacturing Inc.) discloses a coin pay-out apparatus in a slot machine in which coins are dispensed from a bucket by falling onto a rotary disk, and in which a paddle is provided over the exit from the bucket to prevent clogging. Further, after completion of dispensing the disk is rotated in the reverse direction for a time to assist removing any clogging.

The present invention was accomplished in order to overcome the problems involved in the prior art.

It is therefore a first object of the present invention to provide a coin pay-out apparatus, wherein a motor for actuating the coin pay-out apparatus is not driven by an imitation coin pay-out signal generated due to noise or the like.

EP-A2-0 064 822 discloses a coin pay-out apparatus with a rotary disc plate rotated by a motor and which motor is controlled by one of two binary input signals to be turned off. A further separate signal indicates when the direction of rotation of the motor needs to be reversed.

A second object of the present invention is to provide a coin pay-out apparatus, wherein coin clogging, when occurred, can be automatically removed.

In order to achieve the first object, there is provided a coin pay-out apparatus in which a rotary disc plate is rotated by motor to effect a coin pay-out comprising:

controlling means for controlling said motor by a plurality of signals; characterized in that the signals are binary input signals and in that the apparatus further comprises motor drive means at the motor and responsive to said binary input signals to pay-out coins only when a combination of said plurality of input signals is a predetermined combination which includes both high and low binary signal levels.

According to one preferred embodiment of the present invention, the plurality of input signals include a normal rotation signal for actuating a motor in such a manner as to rotate a rotary disc plate in the direction for paying out a coin (i.e., in the normal direction), a reverse rotation signal for rotating the rotary disc plate in the reverse direction in order to automatically remove a coin clogging, and

a drive signal which is emitted until when the number of paid out coins reaches a predetermined number. And, only when the combination of the respective normal, reverse and drive signals is found to be H, L and H, the rotary disc plate is rotated in the direction for paying out a coin.

The apparatus may also include means for detecting the coins discharged from the discharge port and outputting a detection signal, means for generating a reverse rotation signal temporarily, and means for rotating the rotary disc plate in the normal direction again after the rotary disc plate was rotated in the reverse direction by the reverse rotation signal generating means.

According to another preferred embodiment of the present invention, means for detecting non-payment of coins within a predetermined time after a coin pay-out signal is emitted includes a coin sensor which is originally employed for counting the number of paid out coins. In this way, complicated structure of the coin pay-out apparatus is avoided. Generally a hot sensor and a micro switch are used as this coin sensor. When a coin counting signal is not obtained successively from this coin sensor within a predetermined time, a motor for actuating the rotary disc plate is rotated reversely.

The drawings furnished herewith illustrate the best mode presently contemplated for carrying out the present invention and described hereinafter.

In the drawings:

Fig.1 is a schematic diagram of a circuit showing one example of a coin pay-out apparatus according to the present invention;

Fig. 2 is a schematic diagram of a circuit showing one example of a motor driving circuit which may be employed in the present invention;

Fig. 3 is a perspective view of a slot machine with its door opened incorporating a coin pay-out apparatus of the present invention;

Fig. 4 is a perspective view of a coin pay-out apparatus embodying the present invention;

Fig. 5 is a sectional view of an important portion of the coin pay-out apparatus of Fig. 4; and

Fig. 6 is a plan view of an important portion of the coin pay-out apparatus of Fig. 3.

A preferred embodiment of the present invention will be described hereunder with reference to the accompanying drawings.

In Fig. 3 showing a slot machine with its front door 1 opened, a main body 2 axially attached with the front door 1 is provided with a known reel apparatus 3 including three reel members arranged at the outer peripheries with symbol marks. Although the front door 1 is shut when a game is played, a part of the symbol mark arrangement of the respective reel members are visually confirmable through an observation window 4 formed on the front door 1. A coin thrown into the machine prior to start of the slot machine game is fed to a coin selector 5 communicated with a coin inlet port (not shown). The coin selector 5 judges whether the coin thrown into the machine is genuine or not and a coin judged as genuine by the coin selector 5 is fed into a bucket 12 of a coin pay-out apparatus 10 through an outlet port 7 and a trough 8. On the other hand, a coin judged as false by the coin selector 5 is sent back to a coin receiving tray 14 through an outlet port 9, a trough 11 and a chute 13.

When a player hits a prize during play, the coin pay-out apparatus 10 is actuated and corresponding number of coins to the prize are sent out from a chute 15. Such sent-out coins are paid out onto the coin receiving tray 14 through an opening 16 formed in the trough 11. The bucket 12 is provided at its inside with an overflow chute 17 adapted to guide coins thrown into the machine when the bucket 12 is already full of coins into an overflow bucket 18.

In Figs. 4, 5 and 6 showing one example of the coin pay-out apparatus 10, a base plate 22 generally horizontally mounted on the main body 2 of the slot machine is provided with a rotary disc plate 24 rotated by a motor 23 and an output shaft 32a of a gear box 32. The base plate 22 is firmly attached with a guide plate 25 formed in a generally cylindrical shape in such a manner as to enclose the outer periphery of the rotary disc plate 24. A part of the guide plate 25 is formed with a bent portion 25a bending inwardly of the rotary disc plate 24.

A lower edge of the bent portion 25a is formed with a laterally elongated slit 16. The height and width of the slit 26 is large enough to permit only one coin 30 to pass therethrough in its lateral altitude. Between the outer periphery of the rotary disc plate 24 and the inner wall of the guide plate 25, there may be formed with a space as long as the size thereof is less than a radius of the coin 30. At an upper location of the base plate 22, a funnel-shaped bucket 12 with an opening 28 formed at its bottom surface is disposed. A number of coins to be used for pay-out are contained in the bucket 12 and coins thrown into the machine prior to start of a game are also flowed into the bucket 12 every time such coins are thrown into the machine. The coins contained in the bucket 12 are fed onto the rotary disc plate 24 through the opening 28. The rotary disc plate 24 is provided with a supporting post 34 erected upwardly therefrom and extending into the bucket 12 through the opening 28 of the bucket 12. The front end portion of the supporting post 34 is pivotably axially attached with an annular regulating plate 35. A lower flange 34 of the supporting post 34 is planted with a pin 36. Disposed in the vicinity of the slit 26 formed on the guide

plate 25 is an elastic roller 26 made of, for example, a rubber material. This roller 26 is adapted to feed a coin 30 discharged from the slit 26 into the chute 15. The roller 38 is rotated by an output shaft 32b generally horizontally projecting from the gear box 32. In the case that the roller 38 is disposed at an upper location of the rotary disc plate 24 as shown in Fig. 4, it is preferable that the roller 38 is not in contact relation with the rotary disc plate 24. However, if the rotary disc plate 24 and the roller 38 are relatively adjustable in number of rotation and one rotation is not interferred by the other rotation, they may be held in contact relation. Otherwise, the roller 38 may be disposed in a location away from the rotary disc plate 24. Facing to a path of a coin 30a fed by the roller 38, a coin sensor 40 comprising, for example, a hot sensor is provided. The coin sensor 40 is adapted to photoelectrically detect the coins 30a fed by the roller 38 every time they pass and output a detection signal. And, if this detection signal is inputted into a counter, the number of coins 30a fed by the roller 38 can be counted.

In Fig. 1 showing a circuit diagram for controlling the actuation of the rotary disc plate 24, when a player hits a prize as a result of playing a slot machine game, a coin pay-out signal is outputted to a normal rotation signal generating circuit 126 from a prize judging circuit 125. As a result, the normal rotation signal generating circuit 126 outputs an "H" signal to an input terminal 127a of the motor drive circuit 127. At the same time, the prize judging circuit 125 outputs a signal corresponding to kinds of the prize to a pay-out coin number setting circuit 128. Due to the foregoing, the pay-out coin number setting circuit 128 is set with coins corresponding in number to kinds of the prize.

The number of coins set in the pay-out coin setting circuit 128 is compared with the counted figure of the counter 130 by a comparator 129. Since the counter 130 counts the number of coins by adding detection signals emitted from the coin sensor 40 adapted to detect coins 30 paid out from the coin pay-out apparatus, it is held in zero in its initial state. And, at the time point when the comparator 129 is actuated in the manner as mentioned before, the comparator 129 outputs a non-conformity signal. When this non-conformity signal is emitted into the drive signal generating circuit 131, the drive signal generating circuit 131 emits an "H" signal into the input terminal 127b of the motor driving circuit 127. As will be described later, the input terminal 127c of the motor driving circuit 127 is usually fed with an "L" signal.

In this way, when signals fed to the input terminals 127a, 127b and 127c of the motor driving circuit 127 are a combination of "H", "H" and "L", the motor 23 is rotated normally to rotate the rotary disc plate 24 in the direction for pay-out coins. In this way, when the rotary disc plate 24 is rotated, a coin fed onto the upper surface of the rotary disc plate 24 is moved together with the rotary disc plate 24 while moving toward the inner wall of the guide plate 25 due to the centrifugal force received from the rotary disc plate 24. After the outer periphery of the coin is received by the inner wall of the guide plate 25, the coin is rotated together with the rotary disc plate 24 along the inner wall of the guide plate 25.

When the coin moved along the inner wall of the guide plate 25 arrives at the bent portion 25a of the guide plate 25, it is discharged outside of the guide plate 25 through the slit 26. The coin 30 discharged outside is energized by the roller 38 and paid out through the chute 15. The length and width of the slit 26 is formed slightly larger than outer diameters and thicknesses of various coins. Accordingly, coins are surely discharged one by one through the slit 26. On the way to the chute 15 from the roller 38, the coin 30 passes over the coin sensor 40. Accordingly, the coin sensor 40 outputs a pulse-like detection signal. Since this detection signal is inputted into the couter 130, the couter 130 adds up the number of paid out coins for counting.

And, when the counted figure in the counter 130 and the number of coins set up in the pay-out coin number setting circuit 128 are found to be in conformity with respect to each other, the comparator 129 stops outputting a non-conformity signal. At the same time, the comparator 129 emits a conformity signal into the input terminal 126a of the normal rotation signal generating circuit 126. As a result, the output terminals of the normal rotation signal generating circuit 126 and the driving signal generating circuit 131 are generated with "L" signals. In this way, when a combination of signals fed to the input terminals 127a, 127b and 127c of the motor driving circuit 127 is changed to other state from the previous state of "H", "H", "L", the motor 23 is temporarily stopped to finish the coin pay-out action.

By the way, in the afore-mentioned coin pay-out apparatus, even if a number of coins are contained in the bucket 12, the weight of the coins is received by the regulating plate 35 and a large load is not incurred to the rotary disc plate 24. Moreover, since the regulating plate 35 is pivotable with respect to the supporting post 34, even if the regulating plate 35 is enclosed with a number of coins, the rotary disc plate 24 is rotatable irrespective of the foregoing. Thus, the rotary speed of the rotary disc plate 24 is not reduced. Due to the foregoing, the rotary speed, i.e., the coin pay-out speed can be increased extensively. The pin 36 pivotally integrally moved together with the rotary

disc plate 24 agitates coins fed through the opening 28 of the bucket 12 to prevent the coin clogging. However, even if the coin clogging should be taken place in the vicinity of the opening 28 or the regulating plate 35, no coins would be paid out irrespective of the coin pay-out signal outputted from the prize judging circuit 125 and no detection signals are outputted from the coin sensor 40.

When the above situation is brought about, a reverse rotation signal is outputted from the coin detection time counting circuit 133 actuated by the coin pay-out signal. The coin detection time counting circuit 133 is actuated, when no detection signal is inputted from the coin sensor 40 in a certain time from the time point when the coin pay-out signal is outputted or in the midway of the coin pay-out action to actuate the reverse rotation signal generating circuit 134. As a result, the reverse rotation signal generating circuit 134 outputs an "H" signal. This "H" signal is kept for a predetermined time by a timer 135.

The "H" signal kept by the timer 135 is fed to the input terminal 126b of the normal rotation signal generating circuit 126 and the input terminal 127c of the motor driving circuit 127. And, the output signal from the normal rotation signal generating circuit 126 becomes "L" and the motor 23 is stopped its revolving. However, when a combination of signals at the input terminals 127a, 127b and 127c of the motor driving circuit 127 becomes "L", "H", "H", the motor driving circuit 127 causes the motor 23 to rotate reversely. That is, the motor 23 so far rotated normally for paying coins is caused to rotate reversely while the "H" signal from the reverse rotation signal generating circuit 134 is kept in the timer 135. Due to the foregoing, the rotary disc plate 24 is rotated reversely for a predetermined time. Since the reverse rotary force also affects the coin clogged portion, it works extremely effectively when used to remove the coin clogging. Of course, since the pin 36 is also rotated reversely together with the reverse rotation of the rotary disc plate 24, there can be obtained the function for removing the coin clogging at the lower part of the opening 28.

When the predetermined time set in the timer 135 has passed, the output signal of the timer 135 returns to the "L" signal again. Due to the foregoing, the normal rotation signal generating circuit 126 outputs the "H" signal again. Since a combination of signals at the input terminals 127a, 127b and 127c of the motor driving circuit 127 becomes "H", "H", "L", the motor 23 is caused to rotate normally again and the coin pay-out operation is resumed. When a keeping of the "H" signal in the timer 135 is cancelled, the coin detection time counting circuit 133 is reset. As this coin detection time counting circuit 133, there may be used a known timer circuit for counting the predetermined time by serving, for example, the detection signal from the coin sensor 40 as a resetting signal.

And, while one generation of a coin pay-out signal is being effected, the number of generation of the reverse signal is counted by an N counter 62. When the counted figure counted by the N counter 62 reaches, for example, three times, a warning apparatus 63 is actuated to warn that something abnormal has happened. Due to the warning, it is known that there occurred a coin clogging which cannot be removed by reverse rotation of the rotary disc plate 24. The counted figure of the N counter 62 is reset at the time point when a conformity circuit effects an output or when no coin pay-out signal is emitted from the prize judging circuit 125. The warning apparatus may include a second timer.

Fig.2 illustrates one example of the motor driving circuit 127. When a relay driving circuit 136 is inputted with the "H" signal, a power switch 137 is turned on to flow a driving current into the motor 23. On the other hand, when a relay driving circuit 138 is inputted with the "L" signal, change-over switches 140, 140 are connected to position shown by the solid lines to form a normal rotation circuit. Similarly, when this relay driving circuit 138 is inputted with the "H" signal, a reverse rotation circuit is formed as shown by the broken lines in the figure. In this way, if a logical circuit such as an AND circuit, an OR circuit or the like is connected to an after part of the input terminals 127a, 127b and 127c of the motor driving circuit 127 to control the driving of the motor 23 by means of a combination of binary signals and at the same time, to actuate the motor 23 by a combination of signals including the respective binary signals, i.e., both the "H" and "L" signals, such an incidence will be almost completely eliminated as that the motor 23 is suddenly driven due to affection of noise or the like. When the present invention is actually used, the number of input signals for driving the motor 23 may be increased in order to further reduce a possibility of an erroneous operation of the coin pay-out apparatus.

The present invention has been described with reference to the illustrated embodiments. The present invention is applicable to a conventional coin pay-out apparatus in which the rotary disc plate 24 is disposed at angles. It is not only applicable to a coin pay-out apparatus for a slot machine but also to a coin pay-out apparatus used in a money exchanger and various other apparatuses as long as they use a rotary disc plate to be driven by motor with similar effects.

As apparent from the foregoing description, according to the present invention, a motor for actuating a coin pay-out apparatus is driven only

when a combination of a plurality of binary signals is found to be a predetermined one. Further, the combination of such signals includes the respective binary signals. Accordingly, even if there occurs such an incidence as that a plurality of input signals are transferred into one signal level all at once due to affection of noise caused by static electricity, etc. or runaway of a program for controlling the coin pay-out apparatus, the coin pay-out apparatus is not actuated. Thus, the present invention is very effective when used as an apparatus for preventing erroneous operation.

Furthermore, according to the present invention, when no coins are paid even if a coin pay-out apparatus is actuated, the rotary disc plate rotating in the normal direction for coin pay-out is automatically rotated in the reverse direction for a certain time. By rotating the rotary disc plate in the reverse direction in this way, the coin clogging portion likely to occur within a bucket or a connecting portion of the bucket and the coin pay-out apparatus is exerted with the reverse rotation force of the rotary disc plate through coins, thereby to automatically remove the coin clogging. Thus, troublesome work for removing the coin clogging as often experienced when the conventional apparatus is used can be eliminated. In this way, the present invention proves itself to be very effective.

While particular embodiments of the present invention have been shown in the drawings and described above, it will be apparent that many changes may be made in the form, arrangement and positioning of the various elements of the combination. In consideration thereof, it should be understood that preferred embodiments of the present invention disclosed herein are intended to be illustrative only and not intended to limit the scope of the present claims.

Claims

1. A coin pay-out apparatus in which a rotary disc plate (24) is rotated by a motor (23) to effect a coin pay-out comprising:

   controlling means (125, 126, 128-135) for controlling said motor (23) by a plurality of binary input signals and a motor drive means (127) which is responsive to said binary input signals (127 a-c) to pay-out coins characterised in that the coins are only paid out when a combination of said plurality of input signals is a predetermined combination including both high and low binary signal levels.

2. A coin pay-out apparatus according to claim 1, wherein said controlling means (125, 126, 128-135) comprises:

   a prize judging circuit (125) for outputting a coin pay-out signal and a signal corresponding to kinds of a prize;

   a normal rotation signal generating circuit (126) for receiving said coin pay-out signal from said prize judging circuit (125) and outputting an "H" signal;

   a coin number setting circuit (128) for receiving said corresponding signal and setting a coin number corresponding to the kinds of a prize; and

   a comparator (129) for comparing the coin number set in said coin number setting circuit (128) with the coin number actually discharged from said rotary disc plate (24) and outputting at least one of a non-conformity signal and a conformity signal, said motor driving circuit (127) receiving said "H" signal at a first input terminal, said non-conformity signal being inputted into a second input terminal of said motor driving circuit (127) and said conformity signal being inputted to said normal rotation signal generating circuit (126).

3. A coin pay-out apparatus according to claim 1, wherein said predetermined combination is a combination of "H", "H" and "L" signals.

4. A coin pay-out apparatus according to claim 1, wherein said combinations of input signals each comprise a normal rotation signal to selectively rotate said motor (23) in the direction for paying coins, a reverse rotation signal to selectively rotate said motor (23) in the reverse direction, and a driving signal generated until the time when the number of paid out coins reaches a predetermined number.

5. A coin pay-out apparatus according to claim 1, 2, 3 or 4 further comprising

   means (135) for generating a, or the reverse, rotation signal temporarily; and

   means (126) for rotating said rotary disc plate (24) in the normal direction again after said rotary disc plate (24) was rotated in the reverse direction in response to said reverse rotation signal.

6. A coin pay-out apparatus according to claim 5, further comprising a coin sensor (40) disposed in the vicinity of a discharge port (15, 26).

7. A coin pay-out apparatus according to claim 2, wherein said normal rotation signal generating means (126) includes a coin detection time counting circuit (133).

8. A coin pay-out apparatus according to claim 7, wherein said coin detection time counting cir-

cuit (133) is a timer circuit.

9. A coin pay-out apparatus according to claim 5 which further includes means (62, 63) for issuing a warning when the number of generations of said reverse rotation signal reaches a predetermined number during one generation of said coin pay-out signal.

10. A coin pay-out apparatus according to claim 9, wherein said warning issuing means (62, 63) includes a second timer.

Patentansprüche

1. Vorrichtung zur Ausgabe von Münzen, in der eine rotierende Scheibe (24) durch einen Motor (23) gedrehtwird, um eine Münzausgabe zu bewirken, umfassend Steuermittel (125,126,128-135) zum Steuern des Motors (23) durch eine Mehrzahl von binären Eingangssignalen und ein Motorantriebsmittel (127), das auf die binären Eingangssignale (127 a-c) reagiert, um Münzen auszugeben, dadurch gekennzeichnet, daß die Münzen nur ausgegeben werden, wenn eine Kombination der Mehrzahl von Eingangssignalen eine vorgegebene Kombination ist, die sowohl hohe als auch niedrige binäre Signalniveaus umfaßt.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Steuermittel (125,126,128-135) einen Gewinnbestimmungsschaltkreis (125) zur Ausgabe eines Münzausgabesignals und eines Signals entsprechend der Art eines Gewinns, einen Geber (126) für ein Signal für normale Rotation zum Empfang des Münzausgabesignals von dem Gewinnbestimmungsschaltkreis (125) und zur Ausgabe eines "H"-Signals, einen Schaltkreis (128) zur Festlegung der Münzanzahl zum Empfang des der Art eines Gewinns entsprechenden Signals und zum Festlegen einer der Art eines Gewinns entsprechenden Münzanzahl und einen Vergleicher (129) zum Vergleichen der in dem Schaltkreis zum Festlegen der Münzanzahl (128) festgelegten Münzanzahl mit der von der rotierenden Scheibe (24) tatsächlich ausgegebenen Anzahl und zum Ausgeben mindestens eines Konformitäts- oder Nonkonformitätssignals aufweist, wobei der Motorantriebskreis (127) das "H"-Signal an einem ersten Eingangsanschluß empfängt, das Nonkonformitätssignal an einem zweiten Eingangsansanschluß des Motorantriebskreises (127) eingegeben wird und das Konformitätssignal in den Geber (126) für ein Signal für normale Rotation eingegeben wird.

3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die vorgegebene Kombination eine Kombination aus "H","H", und "L" - Signalen ist.

4. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Kombinationen von Eingangssignalen jeweils eine normale Rotation zum wahlweisen Rotieren des Motors (23) in der Richtung für die Münzausgabe, ein Signal für umgekehrte Rotation, um den Motor (23) wahlweise in die entgegengesetzte Richtung rotieren zu lassen, und ein Antriebssignal, das solange generiert wird, bis die Anzahl der ausgegebenen Münzen eine vorbestimmte Anzahl erreicht hat, umfassen.

5. Vorrichtung nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß sie außerdem Mittel (135) zum zeitweisen Generieren eines, oder des umgekehrten, Rotationssignals und Mittel (126) zum Wieder-Rotieren der rotierenden Scheibe (24) in die normale Richtung, nachdem die rotierende Scheibe (24) als Reaktion auf das Signal für die umgekehrte Rotation in die umgekehrte Richtung rotiert worden ist, umfaßt.

6. Vorrichtung nach Anspruch 5, gekennzeichnet durch ei-nen in der Nähe der Ausgabeöffnung (15,26) angeordneten Münzsensor (40).

7. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß das Mittel zum Generieren des Signals für normale Rotation (126) einen Zeitzählschaltkreis (133) zur Anwesenheitsprüfung der Münzen aufweist.

8. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß der Zeitzählschaltkreis (133) zur Anwesenheitsprüfung der Münzen ein Zeitmesserschaltkreis ist.

9. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß sie Mittel (62,63) umfaßt, die eine Warnung ausgeben, wenn die Anzahl der Generierungen des Signals zur umgekehrten Rotation wäh-rend einer Generierung des Münzausgabesignals eine vorbestimmte Anzahl erreicht.

10. Vorrichtung nach Anspruch 9, dadurch gekennzeichnet, daß das Warnungsausgabemittel (62,63) einen zweiten Zeitmesser umfaßt.

Revendications

1. Machine à versement de pièces de monnaie,

dans laquelle un disque rotatif (24) est entraîné en rotation par un moteur (23) pour verser des pièces de monnaie, comprenant des moyens de commande (125, 126, 128-135) pour commander ce moteur (23) par une multiplicité de signaux d'entrée binaires et par des moyens d'entraînement (127) du moteur sensibles à ces signaux d'entrée binaires (127a-c) pour verser des pièces de monnaie, caractérisée en ce que les pièces ne sont versées que lorsqu'une combinaison de cette multiplicité de signaux d'entrée est une combinaison prédéterminée comprenant à la fois des signaux d'entrée binaires hauts et bas.

2. Machine à versement de pièces de monnaie selon la revendication 1, dans laquelle les moyens de commande (125, 126, 128-135) comprennent:

un circuit d'évaluation des gains (125) pour émettre un signal de versement de pièces et un signal correspondant aux types d'un gain;

un circuit générateur de signaux de rotation normale (126) pour recevoir le signal de versement de pièces de ce circuit d'évaluation des gains (125) et émettre un signal ≪H≫;

un circuit de fixation du nombre de pièces (128) pour recevoir ledit signal correspondant et fixer le nombre de pièces correspondant aux types d'un gain; et

un comparateur (129) pour comparer le nombre de pièces fixé dans le circuit de fixation du nombre de pièces (128) avec le nombre de pièces réellement déchargées du disque rotatif (24) et émettre au moins l'un d'un signal de non-conformité et d'un signal de conformité, le circuit d'entraînement (127) du moteur recevant le signal "H" à une première borne d'entrée, le signal de non-conformité étant amené à une deuxième borne d'entrée de ce circuit d'entraînement (127) du moteur et le signal de conformité étant entré dans le circuit générateur de signaux de rotation normale (126).

3. Machine à versement de pièces de monnaie selon la revendication 1, dans laquelle la combinaison prédéterminée est une combinaison de signaux ≪H≫, ≪H≫ et ≪L≫.

4. Machine à versement de pièces de monnaie selon la revendication 1, dans laquelle chaque combinaison de signaux d'entrée comprend un signal de rotation normale pour faire sélectivement tourner le moteur (23) dans le sens approprié pour verser des pièces, un signal de rotation inverse pour faire sélectivement tourner le moteur (23) dans la direction inverse, et un signal d'entraînement émis jusqu'au moment où le nombre de pièces versées atteint un nombre prédéterminé.

5. Machine à versement de pièces de monnaie selon l'une des revendications 1 à 4, comprenant en outre

des moyens (135) pour émettre temporairement un, ou le signal de rotation inverse; et

des moyens (126) pour faire à nouveau tourner le disque rotatif (24) dans la direction normale après que ce disque (24) a tourné dans le sens inverse en réponse au signal de rotation inverse.

6. Machine à versement de pièces de monnaie selon la revendication 5, comprenant en outre un détecteur de pièces (40) disposé au voisinage d'un orifice de décharge (15, 26).

7. Machine à versement de pièces de monnaie selon la revendication 2, dans laquelle les moyens générateurs de signaux de rotation normale (126) comprennent un circuit de comptage du temps de détection des pièces (133).

8. Machine à versement de pièces de monnaie selon la revendication 7, dans laquelle le circuit de comptage du temps de détection des pièces (133) est un circuit d'horloge.

9. Machine à versement de pièces de monnaie selon la revendication 5, qui comporte en outre des moyens (62, 63) pour émettre un avertissement lorsque le nombre de productions de signaux de rotation inverse atteint un nombre prédéterminé pendant une seule production d'un signal de versement de pièces.

10. Machine à versement de pièces de monnaie selon la revendication 9, dans laquelle les moyens d'émission d'avertissements (62, 63) comprennent un deuxième circuit d'horloge.

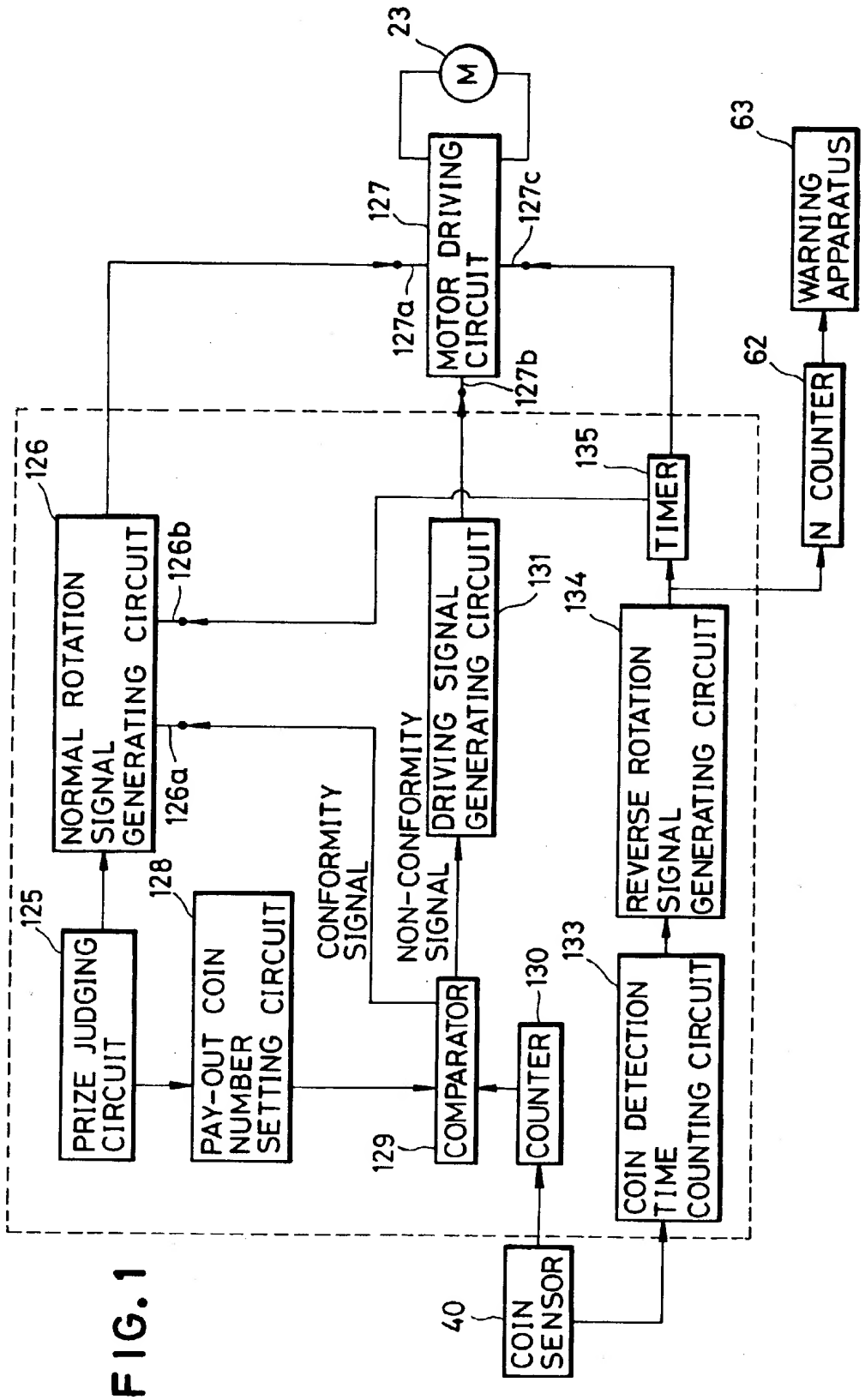

23
M
127
MOTOR DRIVING CIRCUIT
127c
127a
127b
63
WARNING APPARATUS
62
N COUNTER
135
TIMER
126
NORMAL ROTATION SIGNAL GENERATING CIRCUIT
126b
126a
131
DRIVING SIGNAL GENERATING CIRCUIT
134
REVERSE ROTATION SIGNAL GENERATING CIRCUIT
125
PRIZE JUDGING CIRCUIT
128
PAY-OUT COIN NUMBER SETTING CIRCUIT
CONFORMITY SIGNAL
NON-CONFORMITY SIGNAL
129
COMPARATOR
130
COUNTER
133
COIN DETECTION TIME COUNTING CIRCUIT
40
COIN SENSOR

FIG. 1

FIG. 2

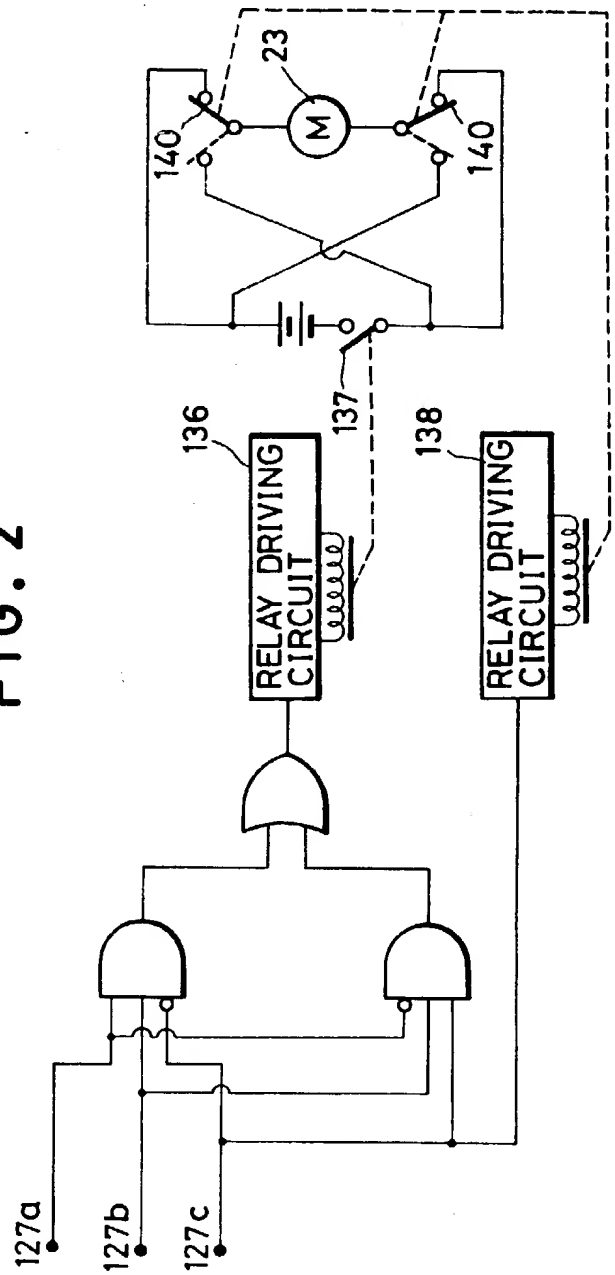

23
M
140
140
137
136
138
RELAY DRIVING CIRCUIT
RELAY DRIVING CIRCUIT
127a
127b
127c

FIG. 3

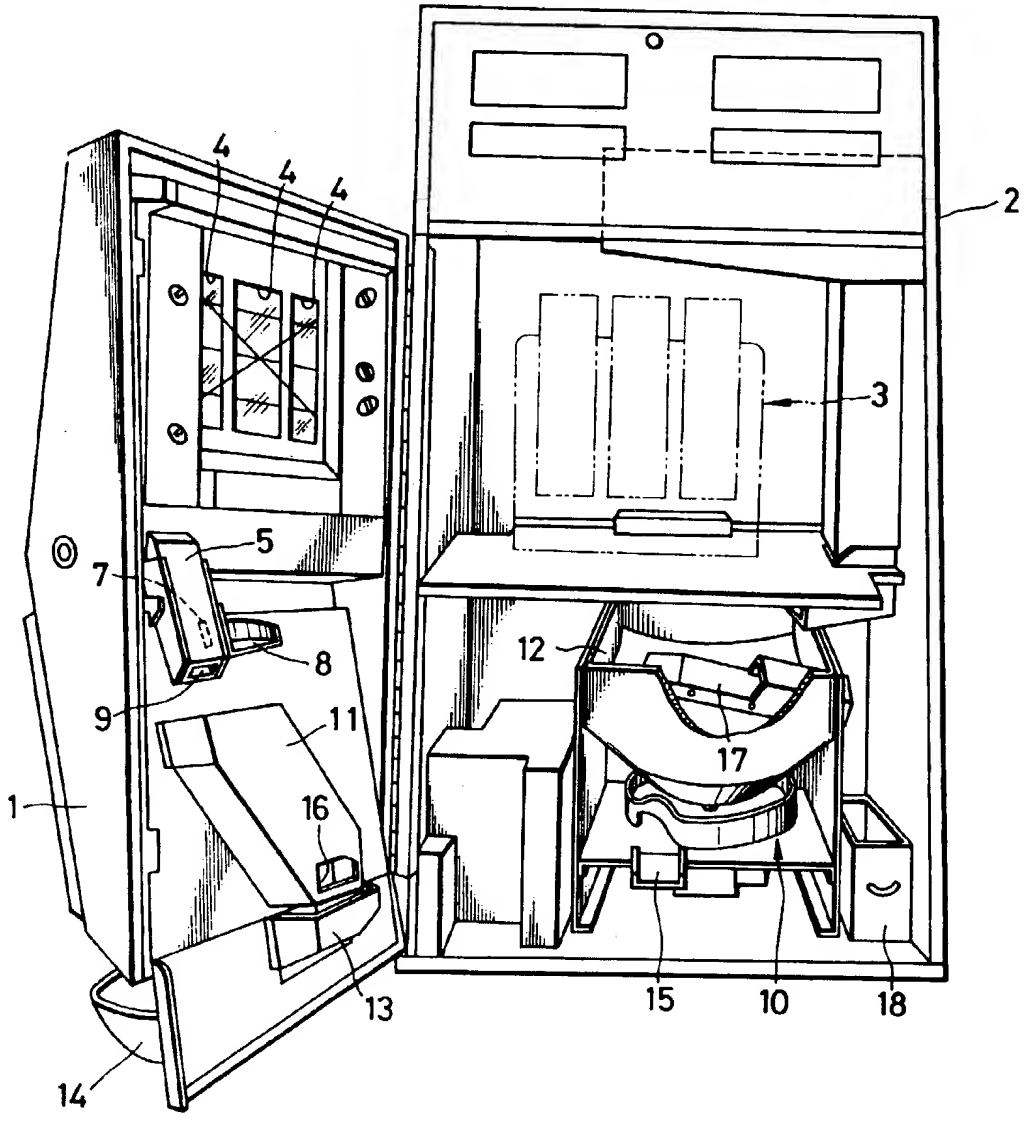


FIG. 4

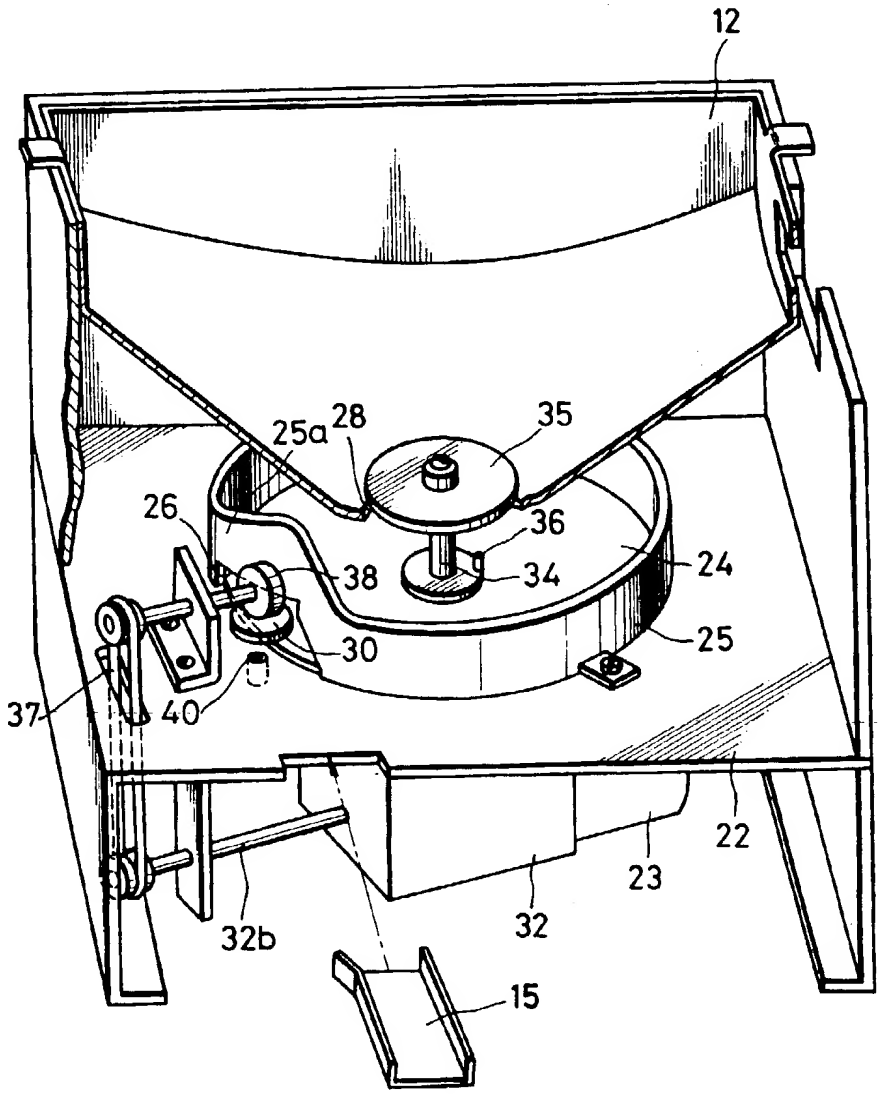


FIG. 5

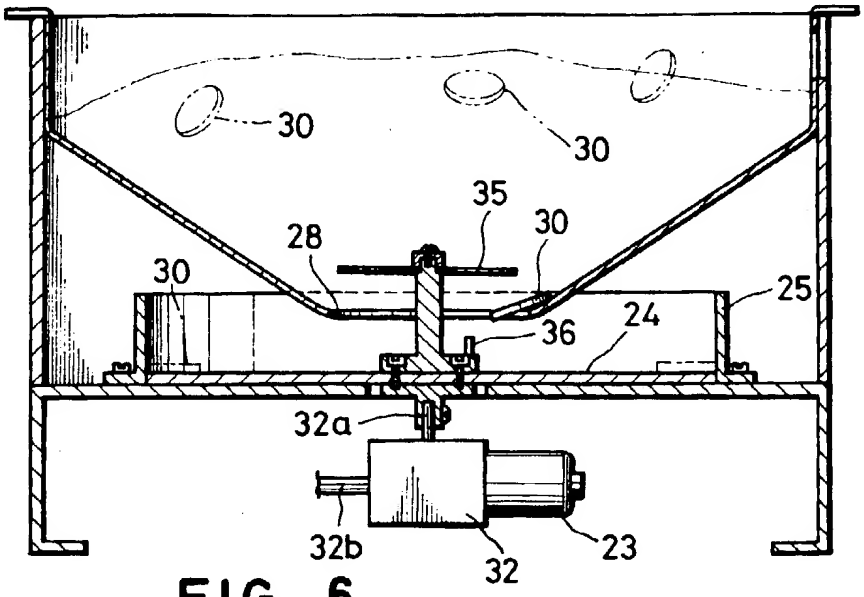
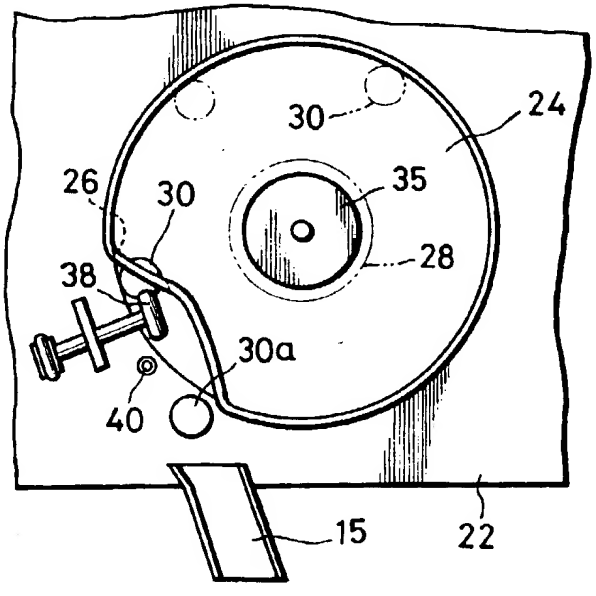

30
30
35
30
28
30
25
24
36
32a
32b
32
23

FIG. 6


30
24
26
30
35
28
38
30a
40
15
22